

STATUS OF GROWTH IN AREA, PRODUCTION AND PRODUCTIVITY OF MAJOR CROPS IN JAMMU PROVINCE OF J&K STATE

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ABSTRACT

Agriculture is the major livelihood activity of majority of rural population in Jammu province of J&K state. Sustained growth in agricultural production and productivity is essential for overall sustainability of the region. It is therefore, necessary to study status of growth in area, production and productivity of important crops in Jammu region. In this paper the main emphasis is given on the objectives as to study the status of growth in area, production and productivity of major crops, to work out the trend in area, production and productivity of major crops in Jammu division and to suggest policy implications to enhance productivity levels of major crops in the region. Also we can say that in the present study, an attempt has been made to analyze the growth in area, production and productivity of major crops in Jammu region for the period from 1984-85 to 2013-14. The present investigation was carried out on the basis of secondary data on growth in area, production and productivity of important crops for the period of thirty years. All the relevant data required for estimating compound growth rate were collected from published sources, annual reports and agencies of Jammu province of J&K State, Government of India. The analysis has been presented in tabular form and the study is mainly descriptive in nature. The comparison has been made over the time to examine the trends in the above mentioned variables. It observed that in Jammu region rice, maize and wheat crop dominated the area and these crops together occupied more than 84 per cent of gross cropped area during the last three decades. The entire period 1984-85 to 2013-14 found that rice, maize, wheat, millets, condiments & spices, fruits & vegetables, fodder crops had positive area growth while pulses, barley, jawar, bajra, sugarcane, oilseeds & fibers had negative area growth as far as production was concerned, it was positive for rice, wheat and pulses and negative for maize whereas as yield was recorded positive for rice, wheat and pulses and negative for maize crop. The study concluded that most of the cultivated land is dominated by cereals groups, therefore, need for crop diversification which ultimately leads to protect soil health, regular returns, employment opportunities as well as better diet balanced for the local people in the region.

KEYWORDS: Area, Production, Yield, Growth & Crop Diversification

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INTRODUCTION

Agriculture is the backbone of Indian economy and at present it is among the top two farm producers in the world, contributing 14 per cent to the Gross Domestic Product, around 50 per cent workforce depend on agriculture for livelihood and about 70 per cent of population is still directly or indirectly dependent on agriculture despite of structural change taking place over the years. The agriculture sector of India has occupied 43 per cent of India's geographical area [1]. Indian agriculture has registered impressive growth over last few decades. The food grain production has increased from 51 million tonnes (MT) in 1950-51 to 250 MT during 2011-12 highest ever

since independence [2]. Although all principle crops have witnessed a significant growth in production, still the recent trends in Indian agriculture presents a dismal picture. The growth rate in production of all principle crops is far behind population growth rate, the net per capita availability of food grains in the country has come down from 471 gram per capita per day during 1190s to 456 gram pet capita per day during 2000 [3].

Agriculture is the mainstay of J&K and it is the main source of income and employment for the majority of population in the state. Nearly 70 per cent of the population in the state derives their livelihood directly or indirectly from agriculture sector. The average land holding in the state is (0.67 ha) and majority of the farmers (78 per cent) in the state are marginal having less than 1ha land holding [4]. Rice is the chief crop of Kashmir zone, followed by maize, barley and wheat. Jammu region dominates both in maize and wheat production. In the Ladakh region, barley is the major cereal crop followed by wheat. The production of three important food crops, namely, rice, maize and wheat, contributes a major portion of the food grain in the State and accounts for 84% of the total cropped area; the balance 16% is shared by other cereals and pulses [5].

As far as from 1955-56, the area under major crops of the state such as rice, maize and wheat was 0.19 mha, 0.20 mha and 0.15 mha, respectively, and it increased by 22.44 per cent in rice, 20.68 per cent in maize and 25.33 per cent in wheat in 1968-69. There was further increase in area of these crops till 1995-96 as the area under rice increased by 13.75 per cent, maize by 24.02 per cent and wheat by 29.68 per cent. After that there was decline in the area of rice by 8.41 per cent while maize and wheat increased by 8.66 per cent and 15.23 per cent, respectively, till 2004-05 when both crops declined, maize by 2.32 per cent and wheat by 10.02 per cent. In the year 2007-08, area under rice and wheat increased by 5.28 per cent and 10.09 per cent, respectively, while maize still showing decline by 6.69 per cent [6].

Similarly, Jammu region also has rural economy where out of the total population 82.70 per cent lives in rural area and is dependent on agriculture. According to the village papers, during 2012-13, the total area is 1794.599 thousand hectares for land use out of which 194.614 thousand hectares are for non-agriculture uses and 243.556 thousand hectares are barren and uncultivable land. The net cultivated area under field crops in Jammu region as reported by the Directorate of Economics and Statistics ranged between 382.51 thousand hectares and 400.954 thousand hectares during the period 2005-06 and 2012-13 and the gross cultivated area ranged between 674.14 thousand hectares and 728.967 thousand hectares respectively. The principal agricultural crops in Jammu region are paddy, jowar, bajra, maize, wheat, barley, pulses and millet. Jammu region dominates both in maize and wheat production, about 70 per cent of the area is under maize and wheat with productivity of (18.53 q /ha) for maize and (15.95 q/ ha) for wheat. This region of the state has maximum cropping intensity of 182.85 per cent (Anonymous, 2012-13).The total production of food grain in the region has hovered between 860.90 thousand Mt to 1267.80 thousand Mt during the year 2005-06 to 2012-13. The production showed an increase from 1009.10 thousand Mt to 1267.80 thousand Mt during the period 2005-06 to 2008-09, but during the 2009-10 it plummeted to 860.90 thousand Mt due to adverse weather conditions [7].

MATERIALS AND METHODS

The present study was carried out on the basis of secondary data collected from published sources of various agencies of Jammu of J&K State, government of India. The data requirement of this study are on growth in area, production and productivity of major crops, intended for estimating compound growth rate as well as percentage change of above mentioned variables. The analysis of data has been presented in tabular form and the study is mainly descriptive in

the nature. The comparison has been made over the time to examine the trends in area, production and productivity of major crops grown in Jammu region for accounting four different period viz; period I (1984-1985 to 1993-1994), period II (1994 -1995 to 2003 -2004), period III (2004 – 2005 to 2013 – 2014) and overall period (1984-85 to 2013-14).

Compound Growth Rates

The Compound Growth Rates were worked out by fitting exponential function of the following type to the data for four periods by many authors.

$$y_t = y_0(1+g)^t \text{ or } a(1+g)^t$$

$$Y = ab^t \text{ (where } b=1+g)$$

$$\text{Or } \log y = \log a + \log b$$

Then, compound growth rate

Where,

Y = Area in hectares, production in quintals and yield in quintals per hectare

a = Intercept

b = Regression coefficient

t = time period (in year)

Finally the annual rate of compound growth in area, production and productivity of the crops was worked out by using the formula

$$r = (\text{Antilog } b - 1) \times 100$$

The significance of the estimated compound growth rates was tested with the help of students' t-test which is given below.

$$t = r/S.E. (r) \sim t_{\alpha_{n-2}}$$

$$S.E. = \sqrt{\frac{b \left[\frac{\sum (\log y)^2 - \frac{(\sum \log y)^2}{n}}{\sum x_i^2} - \log^2 b \right]}{0.43429(n-2)(\sum x_i^2) * 100}}$$

RESULTS AND DISCUSSIONS

Changes in the Area under Food Grains Crops in Jammu Region

The cropping pattern of the region is typical of an under developed agricultural economy in which most of the cultivated area is dominated for food grain crops, particularly cereals. The perusal of the data of last 30 years on changes in cropping pattern of Jammu region (Table 1 and Figure 1) indicated that rice, maize and wheat dominated the cropping pattern during all the years taken into consideration and ranged between 91.03 per cent to 91.06 per cent of area during period I to overall period. While the balance 8.93 per cent to 8.36 per cent of area was recorded by other food grain crops during the same period. It is noted that the area under total pulses and bajra had decreased from 25.57 thousand hectares to 21.10 thousand hectares, 15.39 thousand hectares to 12.67 thousand hectares during period I to overall period. However, the area under barley, jawar, millets increased from 7.64 thousand hectares to 7.77 thousand hectares, 0.10 thousand

hectares to 0.28 thousand hectares and 5.58 thousand hectares to 10.82 thousand hectares respectively.

Decadal Compound Growth Rate (DCGR) revealed that a positive growth trend was observed for rice, maize and wheat crops during the period under study except for rice during period II wherein a non-significant negative growth trend (-0.38 per cent) was observed. The growth trend of these crops varied significantly between 1.05 per cent during period II for maize crop to 1.98 per cent for wheat crop during period III.

Overall period in terms of area under wheat crop had shown positive significantly highest growth trend of 0.70 per cent as compared to rice (0.39 per cent) and maize (0.44 per cent). Barley had shown positively significant growth trend of 4.20 per cent during period II and significantly negative growth trend of -12.98 per cent during period III. While during period I and overall period it had shown non-significantly negative growth trend of -1.04 per cent, -2.04 per cent, respectively. In case of jawar no growth rate was recorded during period I and period II. Whereas it had shown non-significantly negative growth trend of -5.14 per cent and significantly negative growth trend of -2.48 per cent, during period III and overall period respectively. Bajra shown significantly negative growth trend of -2.32 per cent, -5.48 per cent during period I and overall period. While there was recorded positive growth trend of 2.78 per cent, non-significantly negative growth trend of -18.94 per cent during period II and period III under study. There was observed positively significant growth trend of 4.28 per cent and non-significantly negative growth trend of -6.13 per cent for millets during period I and overall period. As far as pulses is concerned, the area under this crop was not showing very encouraging, it was indicated significantly negative growth trend of (-2.56 per cent), (-3.36 per cent), (-1.73 per cent), (-1.63 per cent), from period I to overall period under study.

The (Table 1 and Figure 1) indicated that rice, maize and wheat crops dominated the area and these crops together occupied more than 84 per cent of gross cropped area during last three decades. The main reason behind the growing of these crops is the adaptability and subsistence nature of agriculture in the region, the region is appreciable contribution to production of these crops and farmers grow these crops which are required for family consumption. The main factors responsible for significant growth in area under major crops include higher demand for these crops due to consumption pattern of local people. The result of table further indicated that the efforts, therefore, need for crop diversification in the region which ultimately leads for protection of soil health, as well as better diet balanced for consumption of local people.

Changes in the Area under Non-Food Grain Crops in Jammu Region

The Table 2 and Figure 2 revealed that sugarcane, fibers and drugs, narcotics and plantation crops had decreased from 0.46 thousand hectares to 0.22 thousand hectares, 0.91 thousand hectares to 0.45 thousand hectares and 0.27 thousand hectares to 0.10 thousand hectares respectively, during the period under study. While the area under oilseeds, condiments and spices and fruits and vegetables had marginally increased from 17.09 thousand hectares to 17.31 thousand hectares, 1.20 thousand hectares to 1.34 thousand hectares and 2.72 thousand hectares to 2.95 thousand hectares respectively, during the same period. The area under fodder crop had increased during period II (24.46 thousand hectares) from 21.77 thousand hectares during period I, but again decreased to 22.42 thousand hectares during period III and marginally increased to 22.88 thousand hectares during allover period.

Decadal Compound Growth Rate shown that except period II which was recorded positive growth trend for sugarcane with the value of (0.35 per cent) but on the whole, it had shown non-significantly negative growth trend of -4.54 per cent, -2.32 per cent and significantly negative growth trend during period II, overall period and period I, respectively.

The area under condiments & spices had positively significant growth trend during period I and overall period. While there was shown non-significant positive growth trend of 1.58 per cent and 1.39 per cent during period II and III period. The area under fruits and vegetable had non-significant negative growth trend of -0.29 per cent and -0.55 per cent during period I and period II. Whereas period III and overall period were recorded significantly positive growth with the value of 6.31 per cent, 0.95 per cent significant at 1 per cent level of significance. The area coverage under oilseeds crop though had positively significant growth trend during period I (1.87 per cent) but on the whole, it had non-significant negative growth trend of -0.34 per cent, -0.92 per cent, -0.19 per cent during period II, III and overall period respectively. On the other hand, the area under fiber crop had shown significantly negative growth rate during period I and overall period. While it was observed positive growth trend of 0.66 per cent during period II and non-significant negative growth trend of -8.97 during period III. There was no growth trend recorded in case of dyes & tanning materials and drugs, narcotics & plantation crops during period I and period II. Whereas it had shown significant positive growth trend of 1.93 per cent for dyes and tanning materials during period III and non-significant negative growth trend of -28.75 per cent for drugs, narcotics and plantation crops during period I and also it was showing that non-significant negative growth trend of -22.17 per cent and -2.27 per cent was recorded for dyes & tanning material during period I and overall period and the same growth trend was indicated for drugs, narcotics and plantation crops with the value of -22.17 per cent during period I under study. As far as the area under fodder crop had shown positively significant growth trend of 1.36 per cent during period I and non-significantly negative growth trend with the value of -0.47 per cent during period II whereas it was observed non-significantly positive growth rate with the value of 0.83 per cent and 0.08 per cent during period III and overall period under study.

During period I also it was showing that non-significant negative growth trend of -22.17 per cent and -2.27 per cent was recorded for dyes & tanning material during period I and overall period and the same growth trend was indicated for drugs, narcotics and plantation crops with the value of -22.17 per cent during period I under study. As far as the area under fodder crop had shown positively significant growth trend of 1.36 per cent during period I and non-significantly negative growth trend with the value of -0.47 per cent during period II whereas it was observed non-significantly positive growth rate with the value of 0.83 per cent and 0.08 per cent during period III and overall period under study.

The result of table shown that the region has experienced increase in area under condiments & spices, which is a good indication of for diversification of agriculture in the region. On the other hand, area under fruits & vegetable had increased marginally during the entire period, which was observed negative growth rate during period I and II, while it had positively significant growth rate in period III and overall period. Therefore, there is need to be taken care so to increase commercialization of agriculture in the region. However, it needs to be strengthening by providing technical assistance like modern concept of crop production and financial aid through credit institutions like NABARD, PACCS for the small and marginal farmers of the region.

Production and Yield of Major Crops in Jammu Region

The Table 3 and Figure 3 revealed that production and yield of major crops, during period I, production of rice, maize, wheat and pulses were 1730.07 thousand quintals, 4172.04 thousand quintals, 3743.05 thousand quintals and 68.01 thousand quintals, respectively. During period II, production for rice, wheat and pulses increased with 1751.01 thousand quintals, 3773.02 thousand quintals and 76.05 thousand quintals, respectively, whereas in case of maize the production decreased considerably to 4133.05 thousand quintals. During period III, production for rice, wheat and pulses increased

with 2240.80 thousand quintals, 4671.69 thousand quintals and 88.97 thousand quintals, whereas as maize again recorded decreased production of 4033.05 thousand quintals. During overall period, production maize increased with 4115.26 thousand quintals, while rice, wheat and pulses decreased and were found to be 1807.53 thousand quintals, 4062.79 thousand quintals and 77.85 thousand quintals, respectively.

The table further revealed that during period I yield of rice, maize, wheat and pulses were 14.41 q/ha, 19.53 q/ha, 12.43 q/ha and 2.65 q/ha, respectively. During period II, yield of rice, maize, wheat and pulses were increasing with 15.91 q/ha, 19.67 q/ha, 15.54 q/ha and 3.99 q/ha, respectively. During period III, yield of rice, wheat and pulses increased with 18.61 q/ha, 17.09 q/ha and 4.76 q/ha, respectively, whereas it had shown decrease trend in reference to yield of maize with 18.49 q/ha. During overall period yield of maize was increasing with 19.23 q/ha, while yield of rice, wheat and pulse decreased with 16.31 q/ha, 15.02 q/ha and 3.68 q/ha, respectively.

Decadal Compound Growth Rate revealed that growth rate of and yield during period I for rice found to be non-significant negative growth (-0.02 per cent) and non-significant positive (0.87), maize non-significant positive (0.58 per cent) and (2.18 per cent), wheat significantly negative (-0.92 per cent) and (5.64 per cent significant at 1 per cent level of significance), for pulses non-significant negative (-1.06 per cent) and (0.24 per cent significant at 1 per cent level of significance). During period II, pulses had significant positive growth rate in case of yield with 0.30 per cent, but in terms of production there was recorded non-significant positive growth rate with the value of 2.95 per cent. For production of both rice and wheat had shown non-significant negative growth rate with (-0.34 per cent) and (-2.24 per cent), respectively, whereas there was recorded non-significant positive growth rate for yield of rice and wheat with (0.13 per cent) and (3.04 per cent), respectively. However, for production and yield of maize it was significant positive growth rate with (0.28 per cent) and non-significant negative growth rate of (-0.49 per cent), respectively. During period III, rice and wheat had significant and positive growth rate both in production with 6.42 per cent and 0.89 per cent, while maize and pulses had shown non-significant positive growth rate with the value of 0.72 per cent and 2.67 per cent, respectively. On the other hand, rice and pulses had positive growth trend in reference to yield with (5.00 per cent significant at 5 per cent level of significance) and (0.23 per cent significant at 1 per cent level of significance), whereas maize had non-significant positive growth rate with (0.45 per cent), but wheat crop had shown non-significant negative growth rate with (-2.52 per cent), respectively. In case of overall period, rice and pulses had significant and positive growth rate both in production and yield with (1.23 per cent) and (1.29 per cent), pulses (1.11 per cent) and (0.42 per cent), while wheat crop was having non-significant positive growth rate with (0.84 per cent) and (1.64 per cent significant at 1 level of significance), However, maize crop was recorded non-significant negative growth rate both in production and yield with (-0.08 per cent) and (-0.16 per cent), respectively.

Likewise, the growth rates computed for production and yield of major crops in Jammu region (Table 3 and Figure 3) indicated that during period I, maize had shown positive growth rate, while rice, wheat and pulses witnessed negative growth rate. During period II, maize and pulses experienced positive growth rates while rice and wheat were showing negative growth rate with the value of -0.34 per cent and -2.24 per cent, respectively. Trend of growth was recorded significant positive growth for rice and wheat with the tune of 6.42 per cent and 0.89 per cent during period II, whereas production of maize and pulses were observed non-significant positive growth rate during the same period. As for as the overall period is concerned, rice and pulses had shown significant positive growth rate, while wheat was recorded positive growth rate, but maize experienced negative growth rate. An important matter of progress in agriculture is its

success in eradication of critical dependence on imported food grains and become self-sufficiency by increasing the production. There is no doubt the quantity of productions have been increasing year to year in Jammu region from last three decades, but still there is scope for better progress in case of production. However, increased in output could be achieved by area enhancement and adopting better strategy aimed at increasing food grains production by concentration public sector efforts and resources in Jammu region with a high potential for quick and substantial productivity gains through increased cropping intensity and average yield. The main important elements of this strategy could be: (i) expansion of area under irrigation, (ii) increased and provision of key agricultural inputs like high yielding variety seeds, chemical fertilizers, pesticides and plant protection techniques, (iii) expansion and improvement of institutional support services such as research and extension, (iv) Farm mechanization and altered in agronomic practices and (v) provision of infrastructural items and offsets the impact climate change on major crops.

The table further revealed that in case of yield period I was positively significant growth rate for wheat and pulses with the trend of 5.64 per cent and 0.24 per cent at 1 per cent level of significance whereas rice and maize were observed positive trend of 0.87 per cent and 2.18 per cent, respectively. During period II, pulses were experienced significant positive at 5 per cent level of significance, while yield of rice and wheat had witnessed positive with the value of 0.13 per cent and 3.04 per cent, respectively. However, maize was recorded negative growth rate with the tune of -0.95 per cent during the same period. On the other hand, rice and pulses had shown significant positive growth under period III, while maize was observed positive growth rate and wheat exhibited negative growth rate with -2.52 per cent. As far as overall period is concerned, rice, wheat and pulses had shown positively significant growth rate at 1 per cent level of significant, whereas maize was observed negative growth rate during the same period under study.

Direction of Growth in Area, Production and Yield of Major Crops in Jammu Region

The direction growth in area, production and yield presented in Table 4. revealed that area wise rice, maize, wheat, oilseed, fodder crops and condiments & spices were having positive growth and barely, bajra, sugarcane, jawar, millets, fruits & vegetables, fibers, pulses, dyes & tanning materials, and drugs, narcotics & plantation crops were having negative growth during period I. For same period production of maize was found to be positive while production of rice, wheat, and pulses were having negative growth. As far as in case of yield wise all four crops viz; rice, maize, wheat and pulses were recoded positive growth during the same period under study. During period II, area wise maize, wheat, barley, fibers, bajra, millets, sugarcane and condiments & spices were having positive growth, while rice, fruits & vegetables, jawar, pulses, oilseeds, fodder crops, dyes & tanning materials and drugs, narcotics and plantation crops were having negative growth. In terms of production maize and pulses had positive growth while rice and wheat were having negative growth. Trend of positive growth were seen for rice, pulses and wheat in case of yield, whereas maize was experienced negative growth during the same period.

Similarly, during period III rice, maize, wheat, fodder crops, millets, fruits & vegetables, dyes & tanning materials and condiments & spices were had positive growth and barley, jawar, bajra, sugarcane, fibers, pulses, oilseeds, condiments & spices and drugs, narcotics & plantation crops had negative growth in area. Production wise all four crops viz; rice, maize, wheat and pulses had positive growth, where yield is concerned it was positive for rice, maize and pulses and negative for wheat.

The result of table further shown that for overall period rice, maize, wheat, millets, fodder crops, fruits & vegetables and condiments & spices had positive area growth, while barley, bajra, jawar, sugarcane, fibers, pulses,

oilseeds, dyes & tanning materials, drugs, narcotics & plantation crops had negative area growth. As far as production is concerned, rice, wheat, pulses had positive growth and maize was having negative growth. On the other hand, during the same period, rice, wheat and pulses were having positive growth, while maize was witnessed negative growth during overall period under study.

CONCLUSIONS

The pattern of a region is the reflection of the varied physical and socio economic factors. The cropping pattern of the region is typical of an under developed agricultural economy in which most of the cultivated area is dominated for food grain crops, particularly cereals and the region makes appreciable of contribution to production of group of cereals. The perusal of the data of last 30 years on changes in cropping pattern of Jammu region indicated that rice, maize and wheat dominated the cropping pattern during all the years taken into consideration and ranged between 91.03 per cent to 91.06 per cent of area during period I to overall period. While the balance 8.93 per cent to 8.36 per cent of area was recorded by other food grain crops during the same period. Growth rates in terms of area were positive for rice, maize, wheat, millets, condiments & spices, fruits & vegetables, and fodder crops, while as negative for barley, jawar, bajra, pulses, sugarcane, oilseeds, fibers, dyes & tanning materials and drugs, narcotics & plantation crops. Production was recorded positive for rice, wheat and pulses, while negative for maize. Whereas yield was positive for rice, wheat and pulses and negative for maize during overall period under study.

POLICY SUGGESTIONS

- Promotion of crop diversification.
- Capacity building of farmers related to agronomic practices.
- Adequate and timely supply of inputs.
- Water management plans.
- Credit disbursement for the farmers.
- Expansion of area under irrigation.
- Expansion of area under HYVs.
- Distribution of chemical fertilizers and pesticides at subsidized rate.
- Shift in cropping pattern in favour of high value crops.
- Scientific management to maximize the crop output.
- Bring uncultivated land under cultivation.
- To create awareness among rural community regarding different rural development programmes.
- Create marketing facilities for agricultural produce.
- Policy planners should formulate plan to check construction of buildings on agricultural land.
- Integrated efforts of line departments and other supporting agencies.

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APPENDICES

Table 1: Changes in Area under Food Grain Crops in Jammu Region

Crops	Area (000 Ha)				Decadal Compound Growth Rate (Percent)			
	Period I	Period II	Period III	Overall Period	Period I	Period II	Period III	Over All Period
Rice	109.23 (18.09)	109.60 (17.83)	118.69 (18.51)	112.51 (17.89)	0.03	-0.38	1.49*	0.39*
Maize	200.78 (33.25)	211.57 (34.43)	219.28 (34.21)	210.52 (33.48)	0.28**	1.05*	0.25	0.44*
Wheat	239.68 (39.69)	245.11 (39.89)	247.23 (38.56)	253.01 (40.23)	0.27**	0.78	1.98*	0.70*
Barley	7.46 (1.23)	8.76 (1.42)	7.09 (1.10)	7.77 (1.23)	-1.04	4.20*	-12.98*	-2.04
Jawar	0.10 (0.01)	0.02 (3.25)	0.60 (0.09)	0.28 (0.04)	-	-	-5.14	-2.00**
Bajra	15.39 (2.54)	12.82 (2.08)	9.80 (1.52)	12.67 (2.01)	-2.32**	2.78	-18.94	-5.48*
Millets	5.58 (0.92)	7.41 (1.20)	19.45 (3.03)	10.82 (1.72)	-6.13*	7.24	17.27	4.28**
Total cereals	578.22 (95.76)	595.29 (96.89)	622.14 (97.05)	607.58 (96.63)	1.00*	1.00*	0.99**	1.03*
Total Pulses	25.57 (4.23)	19.05 (3.10)	18.69 (2.91)	21.10 (3.35)	-2.56*	-3.36*	-1.73*	-1.63*
Other food crops	0.00 (0.00)	0.02 (3.25)	0.18 (0.02)	0.08 (0.01)	-1.96	-	-0.01	-0.01**
Gross cropped area	603.79 (100)	614.39 (100)	641.01 (100)	628.76 (100)	0.51	0.65*	1.07*	0.15*

Note: Figures in the parentheses indicates percentage of gross cropped area.

Area in (000 ha) is the decadal mean area of respective period.

*significant at 1% Level of significance (los),**significant at 5% los and ***significant at 10% los.

Source: Agriculture census, Statistical digest (1996-97, 1997-98, 2012-13) Directorate of

Economics and Statistics, Government of J&K.

Table 2: Changes in Area under Non-Food Crops in Jammu Region

Crops	Area (000 Ha)				Decadal Compound Growth Rate (Per Cent)			
	Period I	Period II	Period III	Overall Period	Period I	Period II	Period III	Over All Period
Sugarcane	0.46 (0.99)	0.17 (0.35)	0.03 (0.06)	0.22 (0.47)	-10.16*	0.35	-4.54	-2.32
Condiments & Spices	1.20 (2.59)	1.22 (2.55)	1.61 (3.75)	1.34 (2.91)	3.64**	1.58	1.39	1.46*
Fruits & vegetables	2.72 (5.88)	2.86 (5.99)	2.28 (5.31)	2.95 (6.42)	-0.29	-0.55	6.31*	0.95*
Oilseeds	17.09 (36.97)	18.55 (38.90)	16.29 (37.98)	17.31 (37.68)	1.87**	-0.34	-0.92	-0.19
Fibers	0.91 (1.96)	0.39 (0.81)	0.04 (0.09)	0.45 (0.97)	-8.55*	0.66	-8.97	-4.19**
Dyes & tannings materials	1.52 (3.28)	0.03 (0.06)	0.04 (0.09)	0.53 (1.15)	-22.17	-	1.93**	-2.27
Drugs, narcotics & plantation crops	0.27 (0.58)	0.03 (0.06)	0.00 (0.00)	0.10 (0.21)	-28.75**	-	-	-2.88
Fodder crops	21.77 (47.10)	24.46 (51.30)	22.42 (52.27)	22.88 (49.81)	1.36**	-0.47	0.83	0.08
Other non-food crops	0.28 (0.60)	0.00 (0.00)	0.18 (0.41)	0.15 (0.32)	5.73	-	-	-3.40
Gross cropped area	46.22 (100)	47.68 (100)	42.89 (100)	45.93 (100)	0.84**	-0.51	-1.60	-0.15

Note: Figures in the parentheses indicates percentage of gross cropped area.

Area in (000 ha) is the decadal mean area of respective period.

*significant at 1% los, **significant at 5% los and ***significant at 10% los.

Source: Statistical Digest, Directorate of Economics and Statistics, Government of J&K.

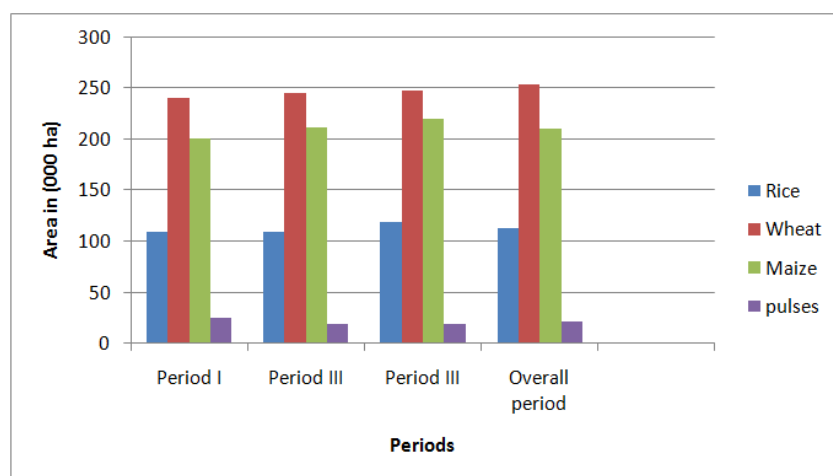


Figure 1: Area under Major Crops in Jammu Region

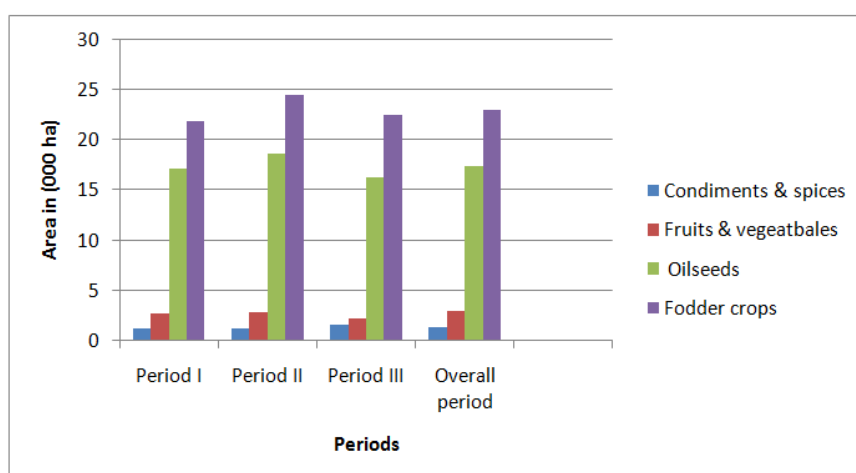


Figure 2: Area under Major Non-Food Crops in Jammu Region

Table 3: Production and Yield of Major Crops in Jammu Region

Crops		Period				Decadal Compound Growth Rate (Per Cent)			
		Period I	Period II	Period III	Overall Period	Period I	Period II	Period III	Over All Period
Rice	Production (000 qtls)	1730.07	1751.01	2240.80	1907.53	-0.02	0.34	6.42**	1.23*
	Yield (q/ha)	14.41	15.91	18.61	16.31	0.87	0.13	5.00**	1.29*
Maize	Production (000 qtls)	4172.04	4133.05	4039.89	4115.26	0.58	0.28	0.72	-0.08
	Yield (000 q/ha)	19.53	19.67	18.49	19.23	2.18	0.95	0.49	-0.16
Wheat	Production (000 qtls)	3743.05	3773.02	4671.69	4062.79	-0.92*	-2.24	0.89*	0.84
	Yield (000 q/ha)	12.43	15.54	17.09	15.02	5.64*	3.04	-2.52	1.64*
Pulses	Production (000 qtls)	68.01	76.05	88.97	77.85	-1.06	2.95	2.67	1.11***
	Yield (000 q/ha)	2.65	3.99	4.76	3.68	0.24*	0.30**	0.23*	0.42*

Note: Production (Quintal 000) and Yield (q/ha) is the decadal mean of respective period.

*significant at 1% los, **significant at 5% los and ***significant at 10% los.

Source: Agriculture census, Statistical digest (1999-2000, 2012-13), Directorate of Economics and Statistics, Government of J&K

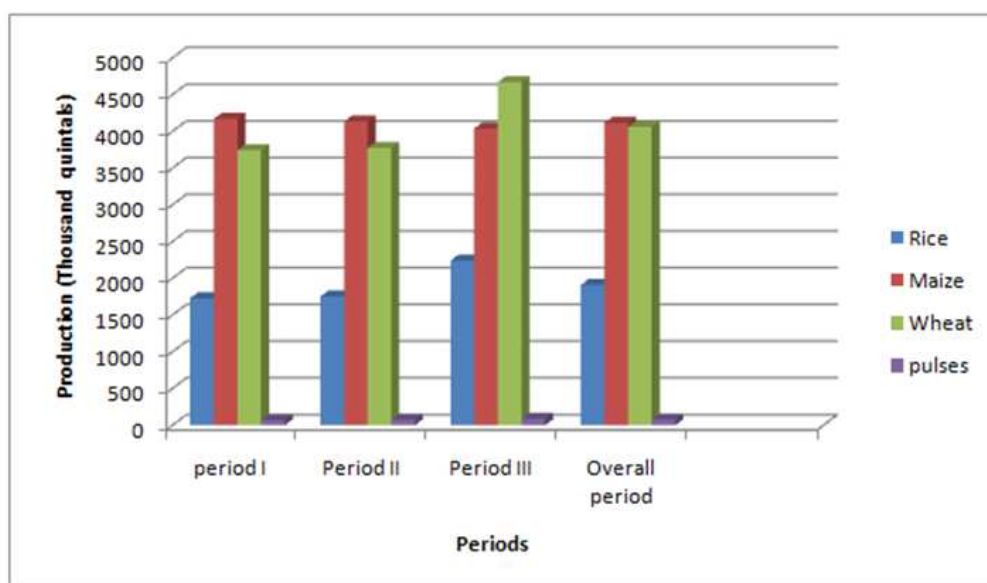


Figure 3: Production of Major Crops in Jammu Region

Table 4: Direction of Growth in Area, Production and Yield of Major Crops in Jammu Regio

Particulars	Direction	Period I	Period II	Period III	Over All Period
Area	Positive	Rice, Maize, Wheat, oilseed, Fodder crops, Condiments & Spices	Maize, Wheat, Barley, Fibers, Bajra, Millets, Condiments & Spices, Sugarcane	Rice, Maize, Wheat, Fruits & vegetables, Fodder crops, Millets, Dyes & tannings materials, Condiments & Spices	Rice, Maize, Wheat, Condiments & spices, Fruits & vegetables, Fodder crops, Millets
	Negative	Barley, Bajra, Sugarcane, Jawar, Millets, Fruits & vegetables, Fibers, Dyes and tanning materials, Drugs, narcotics & plantation crops, pulses	Rice, jawar, Fruits & vegetables,, Drugs, narcotics & plantation crops, Fodder crops, Oilseed Dyes & tannings materials, pluses	Barley, Jawar, Bajra, Sugarcane, Fibers, Drugs, narcotics & plantation crops, Oilseed, pulses	Barley, Bajra, Sugarcane, Fibers, Dyes & tannings materials, jawar Drugs, narcotics & plantation crops, Oilseed, pulses
Production	Positive	Maize,	Maize, Pulses	Rice, Maize, Wheat, pulses	Rice, Wheat, Pulses
	Negative	Rice, Wheat, Pulses	Rice, Wheat		Maize
Yield	Positive	Rice, Maize, Wheat, Pulses	Rice, Pulses, wheat	Rice, Maize, Pulses	Rice, Wheat, Pulses
	Negative		Maize,	Wheat	Maize

Note: *significant at 1% los, **significant at 5% los and ***significant at 10% los.